Compliance With New Ozone Standards

On 17 July 1997, the United States Environmental Protection Agency (USEPA) revised 40 CFR Part 50, establishing a new standard for tropospheric (ground level) ozone. Ozone is a criteria pollutant, not directly emitted, but formed through the complex chemical interaction of sunlight, nitrogen oxides (NO_x) and volatile organic compounds (VOCs). Combustion is the primary source of NO_x while VOCs are emitted from a variety of sources including combustion, chemical processes, painting, and solvent use. The lowered standard is 80 ppb (parts per billion) with the averaging time increased from 1 to 8 hours. Because Air Force operations have the potential to emit both NO_x and VOCs, the new standard may significantly impact the Air Force's mission.

Background:

Ozone is a criteria pollutant regulated by the National Ambient Air Quality Standards(NAAQS) established by the Clean Air Act (CAA). While ozone in the stratosphere provides protection from ultraviolet radiation, exposure for several hours to ozone in the troposphere (ground level) at relatively low levels has been found to damage lung tissue, reduce lung function, and sensitize the lungs to other pollutants. The newly revised standard is meant to protect people from the harmful effects of ozone, but approaches the background concentration for many areas (40 ppb). Thus, attaining the standard may be an impossible task for many areas of the country.

In addition, the Transportation Equity Act for the 21st Century (TEA-21) includes provisions which directly affect the implementation time frame for the new standard. Under the Act, as interpreted in USEPA guidance, states should assess which areas violate the revised ozone standard, which areas attain the standard or those areas for which there is insufficient information to determine a violation, and submit this information along with boundary recommendations for areas violating the standard by July 1999. USEPA plans to "designate" areas as non-attainment for the revised ozone standard based on the most recently available three consecutive years of air quality data. TEA-21 requires USEPA to complete these "designations" for the new ozone standard no later than July 2000. Also, under the CAA, states are required to revise and update their State Implementation Plans (SIPs) as needed within three years after EPA revises a NAAQS, which must then be approved by USEPA. The Agency is issuing periodic guidance intended to help states meet the implementation requirements.

In the quest to attain the standard, regulatory agencies will be looking for any opportunity to reduce VOC and NO_x emissions. Air Force painting / depainting operations may be major VOC emission sources in some locations. Many of the new *so called* "compliant" paints still contain significant amounts of VOCs (up to 2/3 of original amount) which could pose regulatory problems for bases in or adjacent to non-attainment areas.

Aircraft engine exhaust is potentially another large source of NO_x and VOC emissions that is not *currently* heavily regulated; however initiatives to limit allowable emissions from civilian aircraft engines are underway. An understanding of cost-effective options for reduction of NO_x and VOC emissions from military aircraft and maintenance operations, including jet engine test cells (JETCs), could position the Air Force to make informed decisions as regulators further tighten allowable emission levels.

Strategy:

1. The Air Force should continue efforts to identify low VOC painting / depainting materials/procedures that fully support the mission.
2. The development of alternative coating systems / processes and other systems / processes emitting VOCs should include assessments of the ozone forming potential in order to prevent additional regulatory burden.
3. In ozone non-attainment areas where available painting / depainting operations cannot support the ozone standard, consideration should be given to moving such operations to facilities located in ozone attainment areas.
4. Emission control technology for painting / depainting and other VOC-producing operations should be considered as a last resort; however, due to the programming and design lead time, new facility designs underway or planned should consider this option based on anticipated compliance status and emission levels, and other facilities should evaluate and, if anticipated emissions levels and compliance status warrant, take appropriate planning actions.
5. Suppliers of new Air Force equipment should be required to develop and specify maintenance procedures that emit no VOCs.
6. For combustion sources similar to those in the private sector using similar fuels, the Air Force should follow private sector efforts to reduce NO_x formation.
7. Because NO_x production is a function of fuel type as well as combustion conditions and the Air Force uses unique fuels and has unique combustion conditions compared to commercial aircraft (higher operating temperatures plus afterburners), the Air Force should continue to support efforts to understand and eliminate NO_x formation.